Remarks

Claim 1 was rejected under the legal doctrine of issue preclusion. Claim 1 has been cancelled.

Claims 1 and 15-18 have been rejected under 35 U.S.C. 103(a) over Golecki et al. in view of Yoshida et al., Yano et al., Spoor, Piroozmandi, and Swartzendruber. The Examiner relies upon this improper combination to teach that Applicant's method for weight measurement in which a process parameter is changed in response to the rate of weight change during a CVI/CVD process was known in the art. The Applicant respectfully traverses this rejection.

The Examiner contends that Golecki et al. disclose continuously weighing the porous structure during the CVI process. The Examiner, then admits that Golecki et al. disclose the claimed invention but for the fact that Golecki et al. do not weigh the entire furnace during their process while monitoring one particular parameter and changing that parameter to achieve the desired weight gain. Golecki et al. weigh the internal support for the carbon substrates located in the furnace and use an electrical signal proportional to the weight to monitor the weight.

The Examiner then asserts that electronic load sensors loose accuracy when exposed to fluctuating temperature as shown by Yano and Spoor. In view of the fact that heat rises and the fact that the weighing chamber of Golecki et al is attached to the top of and in gaseous communicate with the CVI/CVD chamber, the Examiner asserts that there is a problem with the Golecki et al. design which would be immediately obvious to one of ordinary skill in the art.

The Examiner then asserts that it is known in the weighing arts weighing something that is contained inside an oven it is advantageous to relocate the load cell outside of the hot chamber in order to thermally isolate the load cell as taught by Yoshida et al. (col. 3, lines 54-59). The Examiner then alleges presumably the same effect could be achieved by placing the load cell

under the furnace itself. Further, the Examiner concluded that it would have been obvious to the ordinary practitioner in the weighing arts to modify the design of the weighing apparatus of Golecki et al. to place the load cell under the support legs of the vessel as shown by Piroozmandi and Swartzendruber.

The Examiner's combination of references is erroneous. One of ordinary skill in the art would not combine the references as suggested by the Examiner. The Examiner has used the Applicant's invention as an instruction book to reconstruct the claimed invention.

Golecki et al. (U.S. Patent No. 5,348,774) discloses a method of rapidly densifying a porous structure. If desired, Golecki et al. disclose the use of an in-situ weighing device (e.g. an electronic balance) to continuously monitor the weight of the substrates and susceptor during the densification run. (Golecki et al., col. 7, lines 41-46). An electrical signal proportional to the weight is put out by the electronic balance to the power supply and/or pressure controller and/or mass flow controller so that the process conditions can be optimized and adjusted. (Golecki et al., col. 7, lines 45-53). A chamber houses the balance and is thermostatically slightly above room temperature to ensure stable operation of the balance (Golecki et al., col. 7, lines 4-10).

The Federal Circuit has stated:

> Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. Under Section 103, teachings of references can be combined only if there is some suggestion or incentive to do so. . . The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. *In re Fritch*, 23 U.S.P.Q.2d 1780, 1783-84 (Fed. Cir. 1992).

One of ordinary skill in the art would not combine the teachings of Golecki et al. dealing with a method of rapidly densifying a porous structure with the teachings of the secondary references as

suggested by the Examiner. There is absolutely no reason to combine Golecki et al. with any secondary reference since Golecki et al. describes the optional use of weighing devices.

First, the primary reference deals with weight gain of a substrate in a CVI process due to a chemical reaction. The secondary references do not deal with a method of weight gain of a substrate in a CVI process or the weighing of an entire furnace. Yoshida et al. deal with the moisture content measuring system for coal. Yano et al. disclose an electronic balance for producing a digital output signal as a measured value in response to a force induced upon a tray. Spoor describes a strain-gage transducer incorporating a plurality of electrical resistance stain gages coupled together in a bridge network in order to remain zero-balanced under varying temperature conditions by way of dual resistance foil type unit interposed at one of the output corners of the bridge with its two like foil resistance elements occupying adjacent arms. Piroozmandi discloses a zero height load measuring system that can be installed under a storage vessel. The Piroozmandi system is a load measuring system for measuring the load carried by a support leg. Finally, Swartzendruber teaches an apparatus for precisely measuring the weight of a large amount of feed stored in bulk feed storage bins. The Swartzendruber apparatus include a number of electrical load cells supported upon a foundation. The weight of the bulk feed bins and any feed contained therein is supported upon the load cells by bin support legs. In response to weight induced deformation of the load cell element, electrical signals are transmitted to electrical processing circuitry. This circuitry then device can then provide a display of weight remaining in the bin. From these brief descriptions, it is evident that not one of the secondary references relates to weighing a CVI furnace or use of a weighing device with such a furnace and monitoring the rate of weight and subsequently changing a process parameter.

Clearly the concepts of the primary reference related to rapidly densifying porous substrates the CVI are vastly different from the weighing concepts disclosed in the secondary references. Not one of the secondary references deals with a method of weight gain of a substrate in a CVI process and are consequently not in the field of the Applicant's endeavors. Furthermore, as explained in the Applicant's specification, determining the weight change in the parts during processing of the parts in a CVI/CVD furnace is important in order to adjust the process parameters to arrive at the desired density of the parts. Not one of the secondary references cited by the Examiner deals with such a problem that the Applicant is concerned with or its solution. Consequently, one of ordinary skill in the art would not look to all weighing references as alleged by the Examiner.

Furthermore, the references themselves do not present any motivation to have them combined in the manner suggested by the Examiner nor has the Examiner shown such suggestion. Rather, the Examiner is using the Applicant's specification as a road map to arrive at his improper conclusions.

Even if the references were combined in the manner suggested by the Examiner, they still would not render obvious the Applicant's invention. If Yoshida et al. was combined with Golecki et al., at most one would obtain a CVI furnace with a separate sample container weighing device. Clearly that is not the same as Applicant's claimed invention of measuring the weight change of an entire furnace and changing a process parameter to achieve the desired weight gain.

Although Yano et al. do note that electronic balances are subject to thermal changes in the room temperature and/or those occurring in the balance, the solution to that problem as set forth in their patent is to perform an automatic correction of a measured value by reference to

one or more reference weights. Recognizing that temperature changes cause errors, Spoor uses foil type compensation resistance elements to compensate for temperature changes on zero balance of strain gage transducers. Even combining these three references with the Golecki et al. reference, one would not arrive at the Applicant's claimed invention of measuring the weight change of the entire CVI/CVD furnace, including a part in the furnace which are being densified and then changing a process parameter to achieve the desired weight gain.

Piroozmandi provides for a load measuring system which can quickly and easily be installed on a storage vessel without the need to modify the vessel itself or its inlet or outlet conduits in order to measure the weight of the vessel. Swartzendruber teaches the use of load cells to measure the amount of feed in bulk feed bin containers. Applicant once again reiterates that these teachings of weighing a vessel would not be combined with the teaching of Golecki et al.

Claims 15-18 are patentably distinguished over the multitude of cited prior art references improperly relied upon by the Examiner. The obviousness rejection of Golecki et al in view of Yoshida et al., Yano et al., Spoor, Piroozmandi and Swartzendruber is improper because there is no motivation to combine the references as suggested by the Examiner. However, even if combined, the references to not teach Applicant's claimed invention.

In view of the foregoing discussion, it is respectfully submitted that the 35 U.S.C. 103 rejection is in error and that the final rejection should be withdrawn. In view of the amendments and arguments presented herein, the application is considered to be in condition for allowance. Reconsideration and passage to issue is respectfully requested.

Please charge any additional fees associated with this application to Deposit Order Account No. 501581.

Respectfully submitted,

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